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A coating composition curable upon exposure to both UV radiation and thermal energy, the composition comprising

- (a1) a radiation curable component which polymerizes upon exposure to UV radiation, comprising at least one polymer or oligomer comprising
 - (a11) at least two functional groups comprising at least one bond activatable upon exposure to UV radiation,
- (a2) a thermally curable binder component which polymerizes upon exposure to heat, comprising
 - (a21) at least two functional groups reactive with functional groups (a3),
 - (a3) a thermally durable crosslinking component comprising
 (a31) two or more functional groups reactive with functional groups (a21),
 and
- (a4) optionally, one or more reactive diluents, wherein $^{\rm UV}/_{\rm TH}$ is a value between 0.20 to 0.60.

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- 2. The coating composition of claim 2 wherein $^{UV}/_{TH}$ is between 0.25 to 0.50.
- 3. The coating composition of claim 2 wherein $\frac{VV}{TH}$ is between 0.30 to 0.45.
- 4. The coating composition of claim 1 wherein the thermally curable component (a2) is selected from the group consisting of polyesters, epoxy functional materials, acrylics, and mixtures thereof.
- 5. The coating composition of claim 4 wherein thermally curable binder component (a2) comprises two or more isocyanate reactive functional groups (a21) per molecule.

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The coating composition of claim 5 wherein thermally curable binder component (a2) is a polyester.

- 7. The coating composition of claim 6 wherein isocyanate-reactive functional groups 5 (a21) are hydroxyl groups.
 - 8. The coating composition of claim 1 wherein radiation curable component (a1) further comprises one or more functional groups (a12) which are reactive to functional groups (a31).
 - 9. The coating composition of claim 8 wherein the ratio of NCO groups to the sum of functional groups (a12) and (a21) is less than 1.30.
 - 10. The coating composition of claim 9 wherein functional groups (a12) and (a21) are isocyanate reactive functional groups and functional groups (a31) are isocyanate groups.
 - 11. The coating composition of claim 10 wherein the ratio of NCO groups to the sum of isocyanate-reactive functional groups (a12) and (a21) is from 0.50 to 1.25.
- 20 12. The coating composition of claim 11 wherein the ratio of NCO groups to the sum of isocyanate-reactive functional groups (a12) and (a21) is from 0.75 to 1.10.
 - 13. The coating composition of claim 12 wherein the ratio of NCO groups to the sum of isocyanate-reactive functional groups (a12) and (a21) is less than 1.00.
 - 14. The coating composition of claim 13 wherein the ratio of NCO groups to the sum of isocyanate-reactive functional groups (a12) and (a21) is from 0.75 to 1.00.
- 15. The coating composition of claim 1 wherein thermally curable binder component
 30 (a2) comprises less than 5% by weight of aromatic ring moieties, based on the nonvolatile
 weight of thermally curable binder component (a2)

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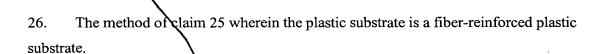
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- The coating composition of claim 15 wherein thermally curable binder component (a2) has no more than 2% by weight of aromatic ring moieties, based on the nonvolatile weight of thermally curable binder component (a2).
- 17. The coating composition of claim 16 wherein thermally curable binder component (a2) has between 0 to less than 2% by weight of aromatic ring moieties, based on the nonvolatile weight of thermally curable binder component (a2).
- 10 18. The coating composition of claim 1 wherein the thermally curable component (a2) has a polydispersity of less than 4.0.
 - 19. The coating composition of claim 18 wherein the thermally curable component (a2) has a polydispersity of less than 3.5.
 - 20. The coating composition of claim 19 wherein the thermally curable component (a2) has a polydispersity of from 1.5 to less than 3.5.
 - 21. The coating composition of claim 20 wherein the thermally curable component (a2) has a polydispersity of from 1.75 to less than 3.0.
 - 22. A method of making a coated substrate, comprising applying the coating composition of claim 1 to a substrate to provide a coated substrate.
- 25 23. The method of claim 22 further comprising subjecting the coated substrate to UV radiation to provide a UV cured coated substrate.
 - 24. The method of claim 23 further comprising subjecting the UV cured coated substrate to heat to provide a UV and thermally cured coated substrate.
 - 25. The method of claim 22 wherein the substrate comprises a plastic.

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- 5 27. The method of claim 25 wherein the plastic substrate is SMC or BMC.
 - 28. The method of claim 24 wherein the UV and thermally cured coated substrate is coated with one or more coating compositions to provide a coated UV and thermally cured coated substrate.
 - 29. The method of claim 28 wherein the W and thermally cured coated substrate is coated with at least one basecoat coating composition.
- 30. The method of claim 28 wherein the UV and thermally cured coated substrate is coated with at least one clearcoat coating composition.
 - 31. The method of claim 28 wherein the coated UV and thermally cured coated substrate is substantially free of surface defects resulting from vaporous substrate emissions.
- 20 32. A coated substrate made by the method of claim 22.

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